Testimony of

The United Illuminating Company

Before the Energy & Technology Committee

Re:
Raised House Bill No. 5362
AAC RENEWABLE ENERGY

Legislative Office Building
March 4, 2010

Good afternoon, Senator Fonfara, Representative Nardello and members of the Energy and Technology Committee. My name is Alan Trotta, and I am the Manager of Wholesale Power Contracts for The United Illuminating Company (UI). In that capacity I manage all aspects of the power procurement process for UI's Standard Service and Last Resort Service customers, including the procurement of renewable energy. I am also UI's team leader for the development of the Integrated Resource Plan for Connecticut (IRP), which is jointly developed by UI and The Connecticut Light & Power Company (collectively, the EDCs).

Raised House Bill No. 5362 (the Bill) provides for an aggressive expansion of solar photovoltaic (PV) energy development in the State, by increasing the financial support that would flow from EDC customers to the specific users of individual solar PV installations. UI supports the development of renewable energy (including solar PV) in Connecticut when the development is feasible and cost-effective. However, as we discuss in this testimony, the Bill in its current form does not promote the development of renewable energy in a cost-effective manner.

UI therefore does not support the Bill in its current form. However, UI could support a bill that promotes the development of in-state renewables, including solar PV, in a manner that lessens the impact on non-participating customers. This can be achieved by scaling the proposed programs back to more modest levels, targeting larger installations that can achieve economies of scale, and seeking voluntary financial support from people and businesses that are interested in promoting renewable energy[1].

The first section of this testimony discusses the cost impact that the solar PV initiatives in the Bill could have on EDC customers. The second section discusses the procurement processes set forth in the Bill, and suggests corrections that would reduce the administrative burden of these processes. The third section briefly discusses UI's concern over new language added in Section 10 that could result in additional subsidies being paid through the Project 150 program. A technical appendix, detailing the calculations included in the testimony, is attached.

1. In its current form, the Bill will impose a substantial cost burden on customers.

Sections 1, 3 and 6 of the Bill set forth an aggressive target of about 290 MW of new solar PV in Connecticut, which would cost approximately $1.8 billion. This $1.8 billion investment would produce only enough energy to meet about 6% of the State's 2020 Class I Renewable Portfolio Standard (RPS) requirement (put another way, a little more than 1% of the State's total energy use). UI estimates that in 2020 the Bill's solar PV initiatives, as written, could have the following cost impacts on customers (see the technical appendix for the calculations):

[1] An example of voluntary financial support could be the development of "solar parks" funded by subscribers who would receive pro-rata shares of the project revenues.

Annual Bill Impact Including Cap in Section 9

Annual Residential Bill Impact	$	8.40
Annual Commercial Bill Impact	$	134.48
Annual Industrial Bill Impact	$	2,180.81

To date, the economics of solar PV development have resulted in about 20 MW of solar PV development in Connecticut, even with subsidization that has occurred as a result of the surcharge specified in section 16-245n of the general statutes

Solar PV is one of the most expensive renewable technologies. The 2010 IRP compared the costs of various renewable energy technologies:

Estimated Cost of Energy, Revenues and REC Price (or Other Financial Incentives) for New Renewable Resources in New England
(2013 Current Trend Scenario)

Technology	Estimated Levelized Costs ($/MWh) [a]	Estimated Levelized Revenues: Energy ($/MWh) [b]	Capacity ($/MWh) [c]	PTC/ITC ($/MWh) [d]	TOTAL ($/MWh) [e]=[b]+[c]+[d]	Estimated REC Price Needed ($/MWh) [f] = max{[a]-[e],0}
Landfill Gas	56.6	76.6	4.3	7.2	88.0	**0.0**
Biomass/Biofuels	110.1	76.6	4.3	14.3	95.2	**14.9**
Hydro	110.0	76.6	7.6	7.2	91.3	**18.6**
Wind	112.5	76.6	2.2	14.3	93.1	**19.4**
Fuel Cells	174.4	76.6	4.1	15.6	96.3	**78.1**
Offshore Wind	199.2	76.6	2.6	14.3	93.5	**105.7**
Solar PV	520.2	76.6	9.3	120.7	206.5	**313.7**

* Note: "PTC" means Production Tax Credit and "ITC" means Investment Tax Credit (both from the federal government)

The 290 MW targeted by the Bill would require about $100 million per year in subsidies from EDC customers to project owners, based upon the IRP data in the table above.

Section 9 of the Bill caps the cost impact on EDC customers by limiting the annual increase in costs to 1% of EDC total retail revenues. Without the cap, the customer costs would be as follows:

Annual Bill Impact Without Section 9 Cap

Annual Residential Bill Impact	$	25.31
Annual Commercial Bill Impact	$	405.26
Annual Industrial Bill Impact	$	6,571.70

Thus, the cap will limit spending, but will also result in actual solar PV development falling far short of targets. There is no doubt that grid-scale solar PV would be less expensive for customers than residential or commercial applications due to economies of scale, but the grid-scale solar PV program set forth in Section 6 is the first program to be suspended in the likely event that costs need to be mitigated. The next program to be impacted would be the installation of commercial PV systems which are more cost-effective than residential systems. UI suggests that any suspension or reduction in programs be conducted on a pro-rata basis.

2. The procurement processes set forth in the Bill are unduly burdensome and would add to customer costs.

Section 4 of the Bill requires that small (up to 2 MW) projects be obtained through competitive solicitation with extensive DPUC and consultant review. Given the approximately 210 MW target set forth in Section 3, this would equate to *hundreds* of individual contracts and contract negotiations, adding substantial burden to the EDCs and to the potential projects. The procurement of solar PV RECs from customer-sited installations can be more efficiently achieved through the use of feed-in tariffs. Such tariffs reduce the administrative costs of participants, and thereby reduce barriers to entry of potential projects. The feed-in tariffs can be designed to provide different rates for the installation size classes contemplated in Section 4(b), and allow for 15 years of eligibility for projects to match the long-term contract term contemplated in Section 3(b).

Section 6, on the other hand, requires a feed-in tariff for the procurement of 50 MW of larger scale solar PV from generators. This is the type of procurement that could work well with competitive solicitations for long-term contracts because there would likely be far fewer, larger contracts. The procurement of larger scale resources could also be effectively performed via a feed-in tariff as proposed in the bill.

3. The changes in Section 10 could result in more than 150 MW of renewable projects being constructed under Project 150.

The new language in Section 10 would require that an additional 45 MW of projects be sought to address project attrition under Project 150. The new language also states that the "intent" is that only 150 MW ultimately reach commercial operation. The Department dockets related to Project 150 clearly show that the resulting contracts will be subsidized by customers, particularly projects that are based on fuel cell technology. UI urges the committee to clarify that new projects will only be added upon the attrition of projects previously selected, and that in no event will more than 150 MW achieve commercial operation.

(Technical Appendix follows on next page)

TECHNICAL APPENDIX

A. Capital Cost Assumptions:

The capital cost used for solar PV in the 2010 IRP is $6,200 per kW, with fixed annual O&M of $25 per kW. The source of this data is the National Renewable Laboratory's Solar Advisor Model, Version 2009.10.13, set to Massachusetts Commercial System.

Additionally, Table 3-A.2 from the Renewable Energy section of the 2010 IRP sets forth the capital charge assumptions used to derive the levelized cost of solar PV energy production.

Table 3-A.2
Capital Charge Estimation Assumptions for Renewable Technologies
(Used in support of Tables 3.15, 3.16, and 3.17)

Operating Life (Years)	20
Tax Depreciation Schedule	5yr SLD
Debt Rate	7.0%
Equity Rate	15.00%
Debt Fraction	50.0%
Effective Tax Rate	42.5%
Inflation Rate	2.1%
ATWACC	9.5%
ATWACC Real	7.3%
Resulting Capital Charge Rate	11.21%

B. Calculation of Installed Cost of $1.8 Billion

The first calculation needed is to convert the 4.35 million MWh commercial solar PV target in Section 3 to a MW target:

4,350,000 MWh/15 years = 290,000 MWh/year

290,000 MWh/year @ 15.8% capacity factor = ~ 210 MW

Next, the installed cost can be calculated by multiplying the targeted levels of capacity (in kW) by the capital cost in $/kW:

Type	MW Target	kW Target	Capital Cost ($/kW)	Installed Cost
Residential (Section 1)	30	30,000	$ 6,200	$ 186,000,000
Commercial (Section 3)	210	210,000	$ 6,200	$ 1,302,000,000
Grid-Scale (Section 6)	50	50,000	$ 6,200	$ 310,000,000
TOTAL				$ 1,798,000,000

The $6,200/kW installation cost is based on commercial installations, such as those contemplated in Section 3. In actuality, the installed cost of residential PV would likely be higher[2], and the installed cost of grid-scale PV would likely be lower. However, since the bulk of the target is for commercial installations, changing the residential and grid-scale numbers would have little impact on the total dollars.

Note that the numbers in this analysis do not include estimates for the addition of solar PV on state facilities contemplated in Section 5 because there were no specific targets stated. However, PV installations at state facilities would likely cost about as much as installations at commercial sites.

C. Calculation of Subsidy Required

The table in Section 1 of this testimony shows a required REC payment of $313.7 for solar PV in 2013 (in 2010 dollars). Table 3.16 in the Renewable Energy section of the 2010 IRP extends the analysis further and shows a required REC payment of $302 in 2020 (also in 2010 dollars). Given that Connecticut's Alternative Compliance Payment (ACP) sets a $55/MWh cap on REC prices, the shortfall of $247/MWh (24.7 c/kWh) would have to funded by a subsidy of that would grow to nearly $100 million per year from EDC customers.

Type	MW Target	MWh @ 15.8% CF	Required REC Price ($/MWh)	Less ACP* of $55	Annual Subsidy
Residential (Section 1)	30	41,522	$ 302	$ 247	$ 10,256,033
Commercial (Section 3)	210	290,657	$ 302	$ 247	$ 71,792,230
Grid-Scale (Section 6)	50	69,204	$ 302	$ 247	$ 17,093,388
TOTAL ANNUAL IN 2020		401,383			$ 99,141,650

* ACP = Statutory Alternative Compliance Payment of $55/MWh (5.5 c/kWh)

D. Calculation of Customer Cost Impact by Rate Class

For the customer bill impact calculations, UI utilized 700 kWh/month for typical residential usage, 11,207 kWh/month for typical commercial usage, and 181,734 kWh/month for typical industrial usage. Total EDC load is projected to be about 32,900,000 MWh in 2020. The quantity of EDC customer load serves to effectively spread out the customer cost impacts on a dollar per customer basis. However, these costs are a direct subsidy from all customers to those customers that are able to take advantage of the programs.

[2] The Connecticut Clean Energy Fund website estimates $7,900 per kW for residential solar PV installations.

	With Sec. 9 Cap	Uncapped
Total Annual Subsidy ($)	$ 32,900,000	$ 99,141,650
EDC Customer Load (MWh)	32,900,000	32,900,000
EDC Customer Load (kWh)	32,900,000,000	32,900,000,000
Unit Rate of Subsidy (c/kWh)	0.100	0.301
Annual Residential Bill Impact (avg. 700 kW monthly usage)	$ 8.40	$ 25.31
Annual Commercial Bill Impact (avg. 11,207 kW monthly usage)	$ 134.48	$ 405.26
Annual Industrial Bill Impact (avg. 181,734 kW monthly usage)	$ 2,180.81	$ 6,571.70

E. Additional Data and Calculations

Here are additional calculations of note:

EDC Customer Load (MWh)	32,900,000
2010 Class I RPS Requirement (MWh)	6,580,000
Solar RECs Produced (MWh)	401,383
Percentage of Class I Met by Solar PV	6.10%
Percentage of EDC Load Met by Solar PV	1.22%